

e e4+all  
E1 0 BT2 D Chemicals and Drugs/CT  
E2 811 BT1 Organic Chemicals/CT  
E3 1047 --> Glycosylation End Products, Advanced/CT  
E4 1047 MN D2.415./CT  
DC an INDEX MEDICUS major descriptor  
NOTE Products derived from the nonenzymatic reaction of  
glucose and proteins invivo that exhibit a  
yellow-brown pigmentation and an ability to  
participate in protein-protein cross-linking. These  
substances are involved in biological processes  
relating to protein turnover and it is believed that  
their excessive accumulation contributes to the  
chronic complications of diabetes mellitus.  
INDX DF: GEPA  
AQ AD AE AG AI AN BI BL CF CH CL CS CT DF DU EC GE HI  
IM IP ME PD PH PK PO RESD SE ST TO TU UR  
PNTE Glycosylation (1988-1992)  
HNTE 93  
MHTH NLM (1993)  
E5 0 UF Advanced Glycation End Products/CT  
E6 0 UF Advanced Glycosylation End Products/CT  
E7 0 UF GEPA/CT  
E8 0 UF Glycation End Products, Advanced/CT  
\*\*\*\*\* END\*\*\*

From headline

```

e e19+all
E1      0  --> Histone H1/CT
E2      12880  USE Histones/CT
***** END***

=> e e2+all
E1      0  BT4 D Chemicals and Drugs/CT
E2      0  BT3 Amino Acids, Peptides, and Proteins/CT
E3      108832 BT2 Proteins/CT
E4      20219 BT1 Nuclear Proteins/CT
E5      0  BT4 D Chemicals and Drugs/CT
E6      0  BT3 Amino Acids, Peptides, and Proteins/CT
E7      108832 BT2 Proteins/CT
E8      6332 BT1 Nucleoproteins/CT
E9      12880 --> Histones/CT
E10     12880 MN D12.776.660.470./CT
E11     12880 MN D12.776.664.469./CT
          DC an INDEX MEDICUS major descriptor
          NOTE Small chromosomal proteins (approx 12-20 kD)
                possessing an open, unfolded structure and
                attached to the DNA in cell nuclei by ionic
                linkages. Classification into the various types
                (designated histone I, histone II, etc.) is based
                on the relative amounts of arginine and lysine in
                each.
          INDX H1, H2a, H2b, H3, etc. go here
          AQ AD AE AG AI AN BI BL CF CH CL CS CT DE DF DU EC GE
             HI IM IP ME PD PH PK PORE SD SE ST TO TU UL UR
          MHTH NLM (1966)
          UF Histone/CT
          UF Histone H1/CT
          UF Histone H1(s)/CT
          UF Histone H2a/CT
          UF Histone H2b/CT
          UF Histone H3/CT
          UF Histone H3.3/CT
          UF Histone H4/CT
          UF Histone H5/CT
          UF Histone H7/CT
***** END***

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From Kiedline

=&gt; fil reg

FILE 'REGISTRY' ENTERED AT 14:33:43 ON 19 DEC 2001  
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Point of Contact:  
 Jan Delaval  
 Librarian-Physical Sciences  
 CM1 1E04 Tel: 308-4403

STRUCTURE FILE UPDATES: 18 DEC 2001 HIGHEST RN 376576-00-0  
 DICTIONARY FILE UPDATES: 18 DEC 2001 HIGHEST RN 376576-00-0

TSCA INFORMATION NOW CURRENT THROUGH July 7, 2001

Please note that search-term pricing does apply when  
 conducting SmartSELECT searches.

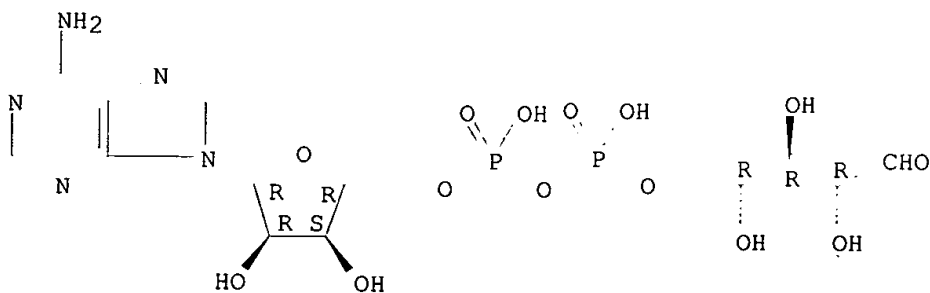
Crossover limits have been increased. See HELP CROSSOVER for details.

Calculated physical property data is now available. See HELP PROPERTIES  
 for more information. See STNote 27, Searching Properties in the CAS  
 Registry File, for complete details:  
<http://www.cas.org/ONLINE/STN/STNOTES/stnotes27.pdf>

=&gt; d ide can tot

L60 ANSWER 1 OF 5 REGISTRY COPYRIGHT 2001 ACS  
 RN 68414-18-6 REGISTRY  
 CN Adenosine 5'-(trihydrogen diphosphate), P'.fwdarw.5-ester with D-ribose,  
 monosodium salt (9CI) (CA INDEX NAME)  
 FS STEREOSEARCH  
 MF C15 H23 N5 O14 P2 . Na  
 LC STN Files: CA, CAPLUS, CHEMCATS, CSCHEM  
 CRN (20762-30-5)

Absolute stereochemistry.



● Na

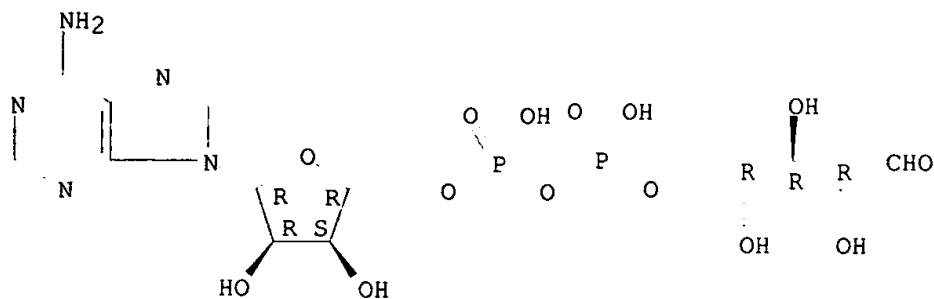
2 REFERENCES IN FILE CA (1967 TO DATE)  
 2 REFERENCES IN FILE CAPLUS (1967 TO DATE)

REFERENCE 1: 100:188283

REFERENCE 2: 89:210588

L60 ANSWER 2 OF 5 REGISTRY COPYRIGHT 2001 ACS  
 RN 32391-12-1 REGISTRY  
 CN Adenosine 5'-(trihydrogen diphosphate), P'.fwdarw.5-ester with D-ribose,  
 sodium salt (9CI) (CA INDEX NAME)  
 FS STEREOSEARCH  
 MF C15 H23 N5 O14 P2 . x Na  
 CRN (20762-30-5)

Absolute stereochemistry.



● x Na

L60 ANSWER 3 OF 5 REGISTRY COPYRIGHT 2001 ACS

RN 26656-46-2 REGISTRY

CN Adenosine 5'-(trihydrogen diphosphate), P'.fwdarw.5-ester with D-ribose, homopolymer (9CI) (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN Adenosine 5'-(trihydrogen pyrophosphate), 5'.fwdarw.5-ester with .beta.-D-ribofuranose, polymers (8CI)

OTHER NAMES:

CN Adenosine diphosphate ribose polymers

CN Oligo(ADP-ribose)

CN Poly(adenosine diphosphate ribose)

CN Poly(adenosine diphosphoribose)

CN Poly(ADP ribose)

FS STEREOSEARCH

DR 25822-80-4, 29131-83-7

MF (C15 H23 N5 O14 P2)x

CI PMS

PCT Polyamine, Polyazomethine, Polyazomethine formed

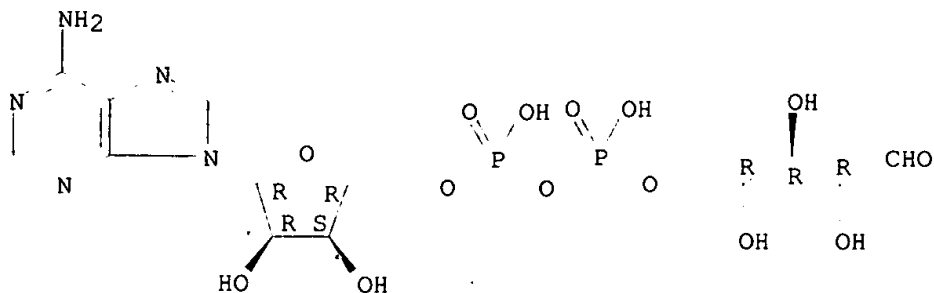
LC STN Files: AGRICOLA, ANABSTR, BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CANCERLIT, CAPLUS, CHEMCATS, CIN, EMBASE, MEDLINE, TOXCENTER, TOXLIT

CM 1

CRN 20762-30-5

CMF C15 H23 N5 O14 P2

Absolute stereochemistry.



691 REFERENCES IN FILE CA (1967 TO DATE)

26 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

691 REFERENCES IN FILE CAPLUS (1967 TO DATE)

REFERENCE 1: 135:238093

REFERENCE 2: 135:133331  
 REFERENCE 3: 134:362108  
 REFERENCE 4: 134:337621  
 REFERENCE 5: 134:263841  
 REFERENCE 6: 134:260974  
 REFERENCE 7: 134:233287  
 REFERENCE 8: 134:218817  
 REFERENCE 9: 134:218580  
 REFERENCE 10: 134:159330

L60 ANSWER 4 OF 5 REGISTRY COPYRIGHT 2001 ACS

RN 20762-30-5 REGISTRY

CN Adenosine 5'-(trihydrogen diphosphate), P'.fwdarw.5-ester with D-ribose (9CI) (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN Adenosine 5'-(trihydrogen pyrophosphate), 5'.fwdarw.5-ester with D-ribofuranose (8CI)

CN Adenosine 5'-diphosphate, D-ribose ester (6CI)

CN Adenosine 5'-pyrophosphate, 5'.fwdarw.5-ester with D-ribofuranose (7CI)

CN Ribofuranose, 5'.fwdarw.5'-ester with adenosine 5'-(trihydrogen pyrophosphate), D- (8CI)

OTHER NAMES:

CN 5-(Adenosine 5'-pyrophosphoryl)-D-ribose

CN Adenosine 5'-diphosphoribose

CN Adenosine diphosphate ribose

CN Adenosine diphosphoribose

CN Adenosine pyrophosphate-ribose

CN ADP ribose

CN ADPR

CN ADPR (nucleotide)

CN Ribose adenosinediphosphate

FS STEREOSEARCH

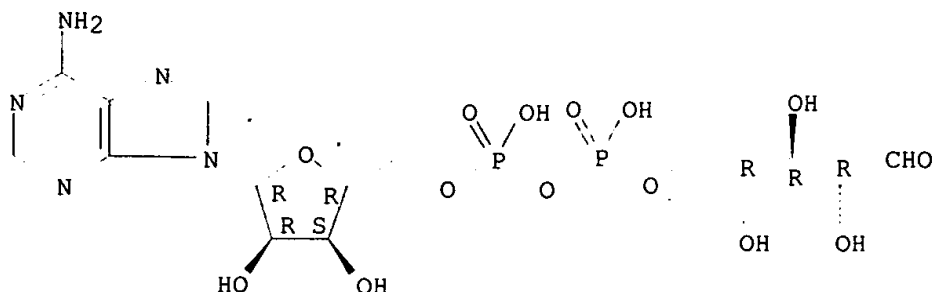
DR 10418-12-9, 86-06-6, 21090-17-5, 2140-57-0, 26635-72-3, 27576-48-3, 28115-73-3, 29352-45-2

MF C15 H23 N5 O14 P2

CI COM

LC STN Files: ADISNEWS, AGRICOLA, ANABSTR, BEILSTEIN\*, BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CANCERLIT, CAOLD, CAPLUS, CIN, EMBASE, IFICDB, IFIPAT, IFIUDB, MEDLINE, NIOSHTIC, TOXCENTER, TOXLIT, USPATFULL  
 (\*File contains numerically searchable property data)

Absolute stereochemistry.



**\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\***

553 REFERENCES IN FILE CA (1967 TO DATE)  
40 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
553 REFERENCES IN FILE CAPLUS (1967 TO DATE)  
11 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 135:327370  
REFERENCE 2: 135:327326  
REFERENCE 3: 135:302851  
REFERENCE 4: 135:287494  
REFERENCE 5: 135:239080  
REFERENCE 6: 135:150356  
REFERENCE 7: 135:88666  
REFERENCE 8: 135:57719  
REFERENCE 9: 135:42585  
REFERENCE 10: 135:30708

L60 ANSWER 5 OF 5 REGISTRY COPYRIGHT 2001 ACS

RN 79-17-4 REGISTRY

CN Hydrazinecarboximidamide (9CI) (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN Guanidine, amino- (8CI)

OTHER NAMES:

CN Aminate base

CN **Aminoguanidine**

CN Carbamimidic acid, hydrazide

CN Guanylhypdrazine

CN Monoaminoguanidine

CN Pimagedine

FS 3D CONCORD

DR 10331-66-5, 146396-78-3

MF C H6 N4

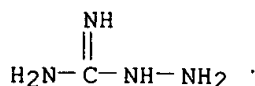
CI COM

LC STN Files: ADISINSIGHT, ADISNEWS, AGRICOLA, ANABSTR, BEILSTEIN\*,  
BIOBUSINESS, BIOSIS, BIOTECHNO, CA, CANCERLIT, CAOLD, CAPLUS, CASREACT,  
CBNB, CHEMINFORMRX, CHEMLIST, CIN, DDFU, DRUGNL, DRUGU, DRUGUPDATES,  
EMBASE, GMELIN\*, HODOC\*, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE, MRCK\*,  
NIOSHITC, PHAR, PROMT, RTECS\*, SPECINFO, SYNTHLINE, TOXCENTER, TOXLIT,  
USAN, USPATFULL, VETU

(\*File contains numerically searchable property data)

Other Sources: EINECS\*\*, WHO

(\*\*Enter CHEMLIST File for up-to-date regulatory information)

**\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\***

990 REFERENCES IN FILE CA (1967 TO DATE)  
55 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
992 REFERENCES IN FILE CAPLUS (1967 TO DATE)  
14 REFERENCES IN FILE CAOLD (PRIOR TO 1967)

REFERENCE 1: 135:366457  
REFERENCE 2: 135:355724  
REFERENCE 3: 135:338859  
REFERENCE 4: 135:328708  
REFERENCE 5: 135:327370  
REFERENCE 6: 135:327326  
REFERENCE 7: 135:315960  
REFERENCE 8: 135:313625  
REFERENCE 9: 135:313423  
REFERENCE 10: 135:313351

=> fil hcaplus

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FILE COVERS 1907 - 19 Dec 2001 VOL 135 ISS 26  
FILE LAST UPDATED: 18 Dec 2001 (20011218/ED)

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=> d all tot 159

L59 ANSWER 1 OF 8 HCAPLUS COPYRIGHT 2001 ACS  
AN 2001:781247 HCAPLUS  
DN 135:327326  
TI Method for identifying regulators of protein-advanced  
glycation end product (protein-AGE)  
formation  
IN Jacobson, Elaine L.; Jacobson, Myron K.; Wondrak,  
Georg Thomas  
PA Niadyne Corporation, USA; University of Kentucky

SO PCT Int. Appl., 50 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM G01N033-50  
 CC 1-1 (Pharmacology)  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001079842	A2	20011025	WO 2001-US12368	20010416
	W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
PRAI	US 2000-197829	P	20000414		
AB	Methods are provided for identifying compds. which affect cellular stress. In particular, the method provides methods for identifying compds. which inhibit <b>protein-advanced glycation</b> <b>end product</b> formation, where the compds. are carbonyl scavengers which inhibit the formation. The assay involves combining the substance of interest with <b>histone H1</b> and <b>ADP</b> <b>-ribose</b> , and then measuring fluorescence and <b>protein</b> crosslinking. Various inhibitors of <b>protein-AGE</b> <b>glycation</b> have been identified using this assay.				
ST	protein AGE formation inhibitor carbonyl scavenger identification				
IT	<b>Glycoproteins, specific or class</b>				
	RL: BPR (Biological process); BIOL (Biological study); PROC (Process) ( <b>AGE (advanced glycosylation end</b> <b>product); protein-advanced</b> <b>glycation end product</b> formation regulator identification)				
IT	Fibroblast				
	(CF-3; <b>protein-advanced glycation</b> <b>end product</b> formation regulator identification)				
IT	<b>Histones</b>				
	RL: BPR (Biological process); BIOL (Biological study); PROC (Process) ( <b>H1; protein-advanced glycation</b> <b>end product</b> formation regulator identification)				
IT	Dicarbonyl compounds				
	RL: BSU (Biological study, unclassified); BIOL (Biological study) (dicarbonyl scavengers; <b>protein-advanced</b> <b>glycation end product</b> formation regulator identification)				
IT	Scavengers				
	(dicarbonyl; <b>protein-advanced glycation</b> <b>end product</b> formation regulator identification)				
IT	Crosslinking				
	( <b>histone H1; protein-advanced</b> <b>glycation end product</b> formation regulator identification)				
IT	Skin				
	(keratinocyte, He-cat; <b>protein-advanced</b> <b>glycation end product</b> formation regulator identification)				
IT	Cytoprotective agents				
	Drug screening				
	Fluorometry				
	<b>Glycation</b>				
	Nucleophiles				
	Test kits				
	<b>(protein-advanced glycation end</b>				



- product formation regulator identification)  
IT Thiols (organic), biological studies  
RL: BAC (Biological activity or effector, except adverse); BIOL (Biological study)  
(protein-advanced glycation end product formation regulator identification)  
IT Proteins, general, biological studies  
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)  
(protein-advanced glycation end product formation regulator identification)  
IT Glycoproteins, general, biological studies  
RL: BPR (Biological process); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative); PROC (Process)  
(protein-advanced glycation end product formation regulator identification)  
IT Albumins, biological studies  
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)  
(serum, AGE-BSA; protein-advanced glycation end product formation regulator identification)  
IT 50-69-1, Ribose 50-99-7, D-Glucose, biological studies 52-66-4, D,L-Penicillamine 52-90-4, L-Cysteine, biological studies 56-41-7, L-Alanine, biological studies 58-68-4, NADH 60-23-1, Cysteamine 62-56-6, Thiourea, biological studies 67-43-6, DTPA 70-18-8, Glutathione, biological studies 74-79-3, L-Arginine, biological studies 79-17-4, Aminoguanidine 87-78-5, Mannitol 107-95-9, .beta.-Alanine 153-18-4, Rutin 454-29-5, Homocysteine 497-30-3, L-Ergothioneine 504-17-6, 2-Thiobarbituric acid 616-91-1, N-Acetylcysteine 2140-58-1, ADP-glucose 2485-62-3, L-Cysteine methyl ester 9001-05-2, Catalase 19246-18-5  
RL: BAC (Biological activity or effector, except adverse); BIOL (Biological study)  
(protein-advanced glycation end product formation regulator identification)  
IT 52-67-5, D-Penicillamine  
RL: BAC (Biological activity or effector, except adverse); RCT (Reactant); BIOL (Biological study)  
(protein-advanced glycation end product formation regulator identification)  
IT 122-78-1, Phenylacetaldehyde 20762-30-5, ADP-ribose  
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)  
(protein-advanced glycation end product formation regulator identification)  
IT 78-98-8, Methylglyoxal 1074-12-0, Phenylglyoxal  
RL: RCT (Reactant)  
(protein-advanced glycation end product formation regulator identification)  
IT 369372-93-0P 369372-94-1P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(protein-advanced glycation end product formation regulator identification)
- L59 ANSWER 2 OF 8 HCAPLUS COPYRIGHT 2001 ACS  
AN 2001:780677 HCAPLUS  
DN 135:327370  
TI Methods of use of penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivatives for the treatment of conditions resulting from DNA, protein, or lipid damage  
IN Jacobson, Myron K.; Jacobson, Elaine L.; Wondrak, Georg T.; Cervantes-Laurean, Daniel  
PA Niadyne Corporation, USA; University of Kentucky Research Foundation  
SO PCT Int. Appl., 39 pp.  
CODEN: PIXXD2  
DT Patent  
LA English  
IC ICM A61K031-198

CC 1-12 (Pharmacology)

FAN.CNT' 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2001078718	A1	20011025	WO 2001-US12325	20010416
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG US 2001051658 A1 20011213 US 2001-836552 20010416				
PRAI	US 2000-197216	P	20000414		
AB	Methods are disclosed for inhibiting damage to proteins, lipids, and DNA by the use of penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane compds. as dicarbonyl scavengers.				
ST	penicillamine dicarbonyl scavenger therapeutic DNA protein lipid damage; aminomercaptodimethylethane deriv dicarbonyl scavenger therapeutic DNA protein lipid damage				
IT	<b>Glycoproteins, specific or class</b>				
	RL: BPR (Biological process); BIOL (Biological study); PROC (Process) (AGE (advanced glycosylation end product)); penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)				
IT	Collagens, biological studies				
	RL: BPR (Biological process); BIOL (Biological study); PROC (Process) (AGE-collagen; penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)				
IT	Fibroblast				
	(CF3; penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)				
IT	<b>Histones</b>				
	RL: BPR (Biological process); BIOL (Biological study); PROC (Process) (H1; penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)				
IT	DNA				
	RL: BPR (Biological process); BIOL (Biological study); PROC (Process) (cleavage; penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)				
IT	Scavengers				
	(dicarbonyl; penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)				
IT	Albumins, biological studies				
	RL: BPR (Biological process); BIOL (Biological study); PROC (Process) (glycoalbumins, AGE-BSA; penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)				
IT	Skin				
	(keratinocyte, HaCat; penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)				
IT	UV A radiation				
	UV B radiation				
	(penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)				
IT	Dicarbonyl compounds				

- RL: BPR (Biological process); BIOL (Biological study); PROC (Process)  
(penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)
- IT Skin, disease  
(photoaging; penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)
- IT DNA  
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)  
(phototoxicity to; penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)
- IT Solar radiation  
(solar-simulated light; penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)
- IT Phototoxicity  
(to DNA; penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)
- IT 52-90-4, L-Cysteine, biological studies 58-68-4, NADH 60-23-1, Cysteamine 62-56-6, Thiourea, biological studies 70-18-8, Glutathione, biological studies 79-17-4, Aminoguanidine 153-18-4, Rutin 454-29-5, Homocysteine 497-30-3, L-Ergothioneine 504-17-6, 2-Thiobarbituric acid 616-91-1, N-Acetylcysteine 2485-62-3, L-Cysteine methyl ester 19246-18-5  
RL: BAC (Biological activity or effector, except adverse); BIOL (Biological study)  
(penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)
- IT 52-67-5, D-Penicillamine  
RL: BAC (Biological activity or effector, except adverse); RCT (Reactant); THU (Therapeutic use); BIOL (Biological study); USES (Uses)  
(penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)
- IT 52-66-4, D,L-Penicillamine 1113-41-3, L-Penicillamine 7684-18-6D, derivs. 20902-45-8, D-Penicillamine disulfide 72744-87-7  
RL: BAC (Biological activity or effector, except adverse); THU (Therapeutic use); BIOL (Biological study); USES (Uses)  
(penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)
- IT 20762-30-5, ADP-ribose  
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)  
(penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)
- IT 122-78-1, Phenylacetaldehyde  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)
- IT 1074-12-0, Phenylglyoxal  
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process)  
(penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)
- IT 78-98-8, Methylglyoxal  
RL: RCT (Reactant)  
(penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-.beta.,.beta.-dimethylethane derivs. for treatment of conditions from DNA, protein, or lipid damage)

IT 369373-68-2P 369373-69-3P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(penicillamines and other .alpha.-amino-.beta.,.beta.-mercapto-  
.beta.,.beta.-dimethylethane derivs. for treatment of conditions from  
DNA, protein, or lipid damage)

RE.CNT 3  
RE  
(1) Anon; Gerontology 1976, V23(2), P77  
(2) Anon; Life Sciences 1999, V65/18-19, P1991  
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L59 ANSWER 3 OF 8 HCAPLUS COPYRIGHT 2001 ACS  
AN 2000:819923 HCAPLUS  
DN 134:83865  
TI **Histone** carbonylation in vivo and in vitro  
AU Wondrak, Georg T.; Cervantes-Laurean, Daniel; Jacobson,  
Elaine L.; Jacobson, Myron K.  
CS College of Pharmacy, University of Kentucky, Lexington, KY, 40506-0286,  
USA  
SO Biochem. J. (2000), 351(3), 769-777  
CODEN: BIJOAK; ISSN: 0264-6021  
PB Portland Press Ltd.  
DT Journal  
LA English  
CC 13-2 (Mammalian Biochemistry)  
AB Non-enzymic damage to nuclear proteins has potentially severe consequences  
for the maintenance of genomic integrity. Introduction of carbonyl groups  
into histones in vivo and in vitro was assessed by Western blot  
immunoassay and reductive incorporation of tritium from radiolabeled NaBH4  
(sodium borohydride). **Histone H1** extd. from bovine  
thymus, liver and spleen was found to contain significantly elevated amts.  
of protein-bound carbonyl groups as compared with core histones. The  
carbonyl content of nuclear proteins of rat pheochromocytoma cells (PC12  
cells) was not greatly increased following oxidative stress induced by  
H2O2, but was significantly increased following alkylating stress induced  
by N-methyl-N'-nitro-N-nitrosoguanidine or by combined oxidative and  
alkylating stress. Free **ADP-ribose**, a reducing-sugar  
generated in the nucleus in proportion to DNA strand breaks, was shown to  
be a potent **histone H1** carbonylating agent in isolated  
PC12 cell nuclei. Studies of the mechanism of **histone**  
**H1** modification by **ADP-ribose** indicate that  
carbonylation involves formation of a stable acyclic ketoamine. Our  
results demonstrate preferential **histone H1**  
carbonylation in vivo, with potentially important consequences for  
chromatin structure and function.

ST histone carbonylation cell nucleus PC12  
IT **Histones**  
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)  
(H1; histone carbonylation in PC12 cell nuclei)

IT Animal cell line  
(PC12; histone carbonylation in PC12 cell nuclei)

IT Ketones, biological studies  
RL: BPR (Biological process); MFM (Metabolic formation); BIOL (Biological  
study); FORM (Formation, nonpreparative); PROC (Process)  
(amino; ketoamine formation in histone carbonylation in PC12 cell  
nuclei)

IT Carbonylation  
Cell nucleus  
**Glycation**  
Liver  
Oxidative stress, biological  
Spleen  
Thymus gland  
(histone carbonylation in PC12 cell nuclei)

IT **Histones**  
RL: BPR (Biological process); BIOL (Biological study); PROC (Process)

- (histone carbonylation in PC12 cell nuclei)
- IT Amines, biological studies  
 RL: BPR (Biological process); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative); PROC (Process)  
 (keto; ketoamine formation in histone carbonylation in PC12 cell nuclei)
- IT Alkylation  
 (stress; histone carbonylation in PC12 cell nuclei)
- IT 20762-30-5, ADP-ribose  
 RL: BPR (Biological process); RCT (Reactant); BIOL (Biological study); PROC (Process)  
 (histone carbonylation in PC12 cell nuclei)
- IT 316383-70-7  
 RL: BPR (Biological process); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative); PROC (Process)  
 (ketoamine formation in histone carbonylation in PC12 cell nuclei)
- IT 316383-67-2  
 RL: BPR (Biological process); MFM (Metabolic formation); RCT (Reactant); BIOL (Biological study); FORM (Formation, nonpreparative); PROC (Process)  
 (ketoamine formation in histone carbonylation in PC12 cell nuclei)
- IT 1946-82-3, N-Acetyl-L-lysine  
 RL: BPR (Biological process); RCT (Reactant); BIOL (Biological study); PROC (Process)  
 (ketoamine formation in histone carbonylation in PC12 cell nuclei)
- RE.CNT 41
- RE
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- L59 ANSWER 4 OF 8 HCAPLUS COPYRIGHT 2001 ACS  
 AN 2000:720103 HCAPLUS  
 DN 134:67675  
 TI Formation of a **protein-bound pyrazinium free radical cation** during **glycation of histone H1**  
 AU **Wondrak, G. T.**; Varadarajan, S.; Butterfield, D. A.; **Jacobson, M. K.**  
 CS College of Pharmacy, University of Kentucky, Lexington, KY, USA  
 SO Free Radical Biol. Med. (2000), 29(6), 557-567  
 CODEN: FRBMEH; ISSN: 0891-5849  
 PB Elsevier Science Inc.  
 DT Journal  
 LA English  
 CC 6-3 (General Biochemistry)  
 AB **Glycation**, the nonenzymic reaction between protein amino groups and reducing sugars, induces protein damage that has been linked to several pathol. conditions, esp. diabetes, and general aging. Here we describe the direct identification of a protein-bound free radical formed during early **glycation of histone H1** in vitro. Earlier EPR anal. of thermal browning reactions between free amino acids and reducing sugars has implicated the sugar fragmentation product glycolaldehyde in the generation of a 1,4-disubstituted pyrazinium free radical cation. In order to evaluate the potential formation of this radical in vivo, the early **glycation** of BSA, lysozyme, and **histone H1** by several sugars (D-glucose, D-ribose, **ADP-ribose**, glycolaldehyde) under conditions of physiol. pH and temp. was examd. by EPR. The pyrazinium free radical cation was identified on **histone H1 glycated** by glycolaldehyde (g = 2.00539, aN = 8.01 [2N], aH = 5.26 [4H], aH = 2.72 [4H]), or **ADP-ribose**. Reaction of glycoaldehyde with poly-L-lysine produced an identical signal, whereas reaction with BSA or lysozyme produced only a minor unresolved singlet signal. In the absence of oxygen the signal was stable over several days. Our results raise the possibility that pyrazinium radicals may form during **glycation of histone H1** in vivo.
- ST protein bound pyrazinium radical cation **glycation histone H1**  
 IT **Histones**  
 RL: BPR (Biological process); PRP (Properties); RCT (Reactant); BIOL (Biological study); PROC (Process)  
 (H1; formation of a protein-bound pyrazinium free radical cation during **glycation of histone H1**)
- IT Crosslinking  
**Glycation**  
 (formation of a protein-bound pyrazinium free radical cation during **glycation of histone H1**)
- IT 50-69-1, D-Ribose 141-46-8 20762-30-5, **ADP-ribose**  
 RL: BPR (Biological process); RCT (Reactant); BIOL (Biological study); PROC (Process)  
 (formation of a protein-bound pyrazinium free radical cation during **glycation of histone H1**)
- IT 41927-79-1D, Pyrazine radical cation, protein-bound derivs.  
 RL: FMU (Formation, unclassified); MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative)  
 (formation of a protein-bound pyrazinium free radical cation during **glycation of histone H1**)
- IT 56-87-1, L-Lysine, biological studies 1946-82-3, N.alpha.-Acetyl-L-lysine 25104-18-1, Poly-L-lysine 38000-06-5, Poly-L-lysine  
 RL: BPR (Biological process); RCT (Reactant); BIOL (Biological study); PROC (Process)  
 (**glycation**; formation of a protein-bound pyrazinium free radical cation during **glycation of histone**)

: H1)

IT 70-18-8, Glutathione, biological studies  
RL: BAC (Biological activity or effector, except adverse); BPR (Biological process); RCT (Reactant); BIOL (Biological study); PROC (Process)  
(role as protective agent against protein glycation;  
formation of a protein-bound pyrazinium free radical cation during  
glycation of histone H1)

RE.CNT 52

RE

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L59 ANSWER 5 OF 8 HCAPLUS COPYRIGHT 2001 ACS

AN 1997:627780 HCAPLUS

DN 127:304656

TI ADP-ribose in glycation and

- glycoxidation reactions**
- AU **Jacobson, Elaine L.; Cervantes-Laurean, Daniel; Jacobson, Myron K.**
- CS Department of Clinical Sciences and Division of Medicinal Chemistry and Pharmaceutics, College of Pharmacy, A323A ASTeCC University of Kentucky, Lexington, KY, 40506-0286, USA
- SO Adv. Exp. Med. Biol. (1997), 419(ADP-Ribosylation in Animal Tissues), 371-379
- CODEN: AEMBAP; ISSN: 0065-2598
- PB Plenum
- DT Journal
- LA English
- CC 7-3 (Enzymes)
- AB **Glycation** is initiated by reaction of a reducing sugar with a **protein amino group** to generate a Schiff base adduct. Following an Amadori rearrangement to form a ketoamine adduct, a complex chem. involving oxidn. often leads to **protein glycoxidn.** products referred to as **advanced glycosylation end products (AGE)**. The AGE include **protein carboxymethyllysine (CML)** residues and a heterogeneous group of complex modifications characterized by high fluorescence and **protein-protein crosslinks**. The sugar sources for the **glycoxidn.** of intracellular **proteins** are not well defined but pentoses have been implicated because they are efficient precursors for the formation of the fluorescent AGE, pentosidine. **ADP-ribose**, generated from NAD by **ADP-ribose transfer reactions**, is a likely intracellular source of a reducing pentose moiety. Incubation of **ADP-ribose** with **histones** results in the formation of ketoamine **glycation** conjugates and also leads to the rapid formation of **protein CML** residues, **histone H1** dimers, and highly fluorescent products with properties similar to the AGE. **ADP-ribose** is much more efficient than other possible pentose donors for **glycation** and **glycoxidn.** of **protein amino groups**. Recently developed methods that differentiate nonenzymic modifications of **proteins** by **ADP-ribose** from enzymic modifications now allow investigations to establish whether some **protein** modifications by monomers of **ADP-ribose** in vivo represent **glycation** and **glycoxidn.**
- ST **ADP ribose glycation glycoxidn**
- IT **protein**
- IT **Glycation**  
(ADP-ribose in glycation and glycoxidn. reactions)
- IT **Glycoproteins (general), biological studies**  
**Histone H1**  
**Histones**
- RL: BPR (Biological process); BIOL (Biological study); PROC (Process)  
(ADP-ribose in glycation and glycoxidn. reactions)
- IT **Advanced glycation end products**  
RL: MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative)  
(ADP-ribose in glycation and glycoxidn. reactions)
- IT **Oxidation (biological)**  
(glyco-; ADP-ribose in glycation and glycoxidn. reactions)
- IT **20762-30-5, ADP-ribose**  
RL: BPR (Biological process); RCT (Reactant); BIOL (Biological study); PROC (Process)  
(ADP-ribose in glycation and glycoxidn. reactions)
- IT **56-87-1D, L-Lysine, Carboxymethyl derivs.**  
RL: MFM (Metabolic formation); BIOL (Biological study); FORM (Formation, nonpreparative)



:(protein residues; ADP-ribose in glycation  
and glycoxidn. reactions)

- L59 ANSWER 6 OF 8 HCAPLUS COPYRIGHT 2001 ACS  
AN 1996:282926 HCAPLUS  
DN 124:335954  
TI Glycation and glycooxidation of histones by  
ADP-ribose  
AU Cervantes-Laurean, Daniel; Jacobson, Elaine L.; Jacobson,  
Myron K.  
CS Div. Med. Chem. Pharmaceuticals, Univ. Kentucky, Lexington, KY, 40536, USA  
SO J. Biol. Chem. (1996), 271(18), 10461-10469  
CODEN: JBCHA3; ISSN: 0021-9258  
DT Journal  
LA English  
CC 6-3 (General Biochemistry)  
AB The reaction of long lived proteins with reducing sugars has  
been implicated in the pathophysiol. of aging and age-related diseases. A  
likely intranuclear source of reducing sugar is ADP-  
ribose, which is generated following DNA damage from the turnover  
of ADP-ribose polymers. In this study, ADP-  
ribose has been shown to be a potent histone  
glycation and glycoxidn. agent in vitro. Incubation of  
ADP-ribose with histones H1, H2A,  
H2B, and H4 at pH 7.4 resulted in the formation of ketoamine  
glycation conjugates. Incubation of histone H1  
with ADP-ribose also rapidly resulted in the formation  
of protein carboxymethyllysine residues, protein-  
protein cross-links, and highly fluorescent products with  
properties similar to the advanced glycosylation  
end product pentosidine. The formation of  
glycoxidn. products was related to the degradn. of ketoamine  
glycation conjugates by two different pathways. One pathway  
resulted in the formation of protein carboxymethyllysine  
residues and release of an ADP moiety contg. a glyceric acid fragment. A  
second pathway resulted in the release of ADP, and it is postulated that  
this pathway is involved in the formation of histone-  
histone cross-links and fluorescent advanced  
glycosylation end products.  
ST histone glycation glycoxidn ADP  
ribose  
IT Histones  
RL: BSU (Biological study, unclassified); RCT (Reactant); BIOL (Biological  
study)  
(H1, glycation and glycoxidn. of  
histones by ADP-ribose)  
IT Histones  
RL: BSU (Biological study, unclassified); RCT (Reactant); BIOL (Biological  
study)  
(H2A, glycation and glycoxidn. of histones  
by ADP-ribose)  
IT Histones  
RL: BSU (Biological study, unclassified); RCT (Reactant); BIOL (Biological  
study)  
(H2B, glycation and glycoxidn. of histones  
by ADP-ribose)  
IT Histones  
RL: BSU (Biological study, unclassified); RCT (Reactant); BIOL (Biological  
study)  
(H4, glycation and glycoxidn. of histones  
by ADP-ribose)  
IT Glycosidation  
(glycation, glycation and glycoxidn. of  
histones by ADP-ribose)  
IT 20762-30-5, ADP-ribose  
RL: BSU (Biological study, unclassified); RCT (Reactant); BIOL (Biological

study) .  
(glycation and glycoxidn. of histones by  
ADP-ribose)

- L59 ANSWER 7 OF 8 HCAPLUS COPYRIGHT 2001 ACS  
AN 1995:233754 HCAPLUS  
DN 122:26022  
TI Glycation of proteins by ADP-ribose  
AU Jacobson, Elaine L.; Cervantes-Laurean, Daniel; Jacobson, Myron K.  
CS College of Allied Health Professions, University of Kentucky, Lexington, KY, 40536, USA  
SO Mol. Cell. Biochem. (1994), 138(1/2), 207-12  
CODEN: MCBIB8; ISSN: 0300-8177  
DT Journal; General Review  
LA English  
CC 6-0 (General Biochemistry)  
AB A review, with 44 refs. Numerous metabolic pathways generate free ADP-ribose at many locations within cells. The metabolic fates of this nucleotide are poorly understood and measurement of it in situ is tech. difficult at present. Yet considerable evidence has accumulated implicating that protein glycation by ADP-ribose can occur. This evidence is reviewed here along with recent developments in characterizing the chem. of this reaction and the application of this information to the identification of this posttranslational modification in protein in situ.  
ST review glycation protein ADP ribose  
IT Proteins, biological studies  
RL: BPR (Biological process); BIOL (Biological study); PROC (Process) (glycation of proteins by ADP-ribose)  
IT Glycosidation  
(ADP-ribosidation, glycation of proteins by ADP-ribose)  
IT 20762-30-5, ADP ribose  
RL: BPR (Biological process); BIOL (Biological study); PROC (Process) (glycation of proteins by ADP-ribose)
- L59 ANSWER 8 OF 8 HCAPLUS COPYRIGHT 2001 ACS  
AN 1993:213421 HCAPLUS  
DN 118:213421  
TI Protein glycation by ADP-ribose:  
Studies of model conjugates  
AU Cervantes-Laurean, Daniel; Minter, David E.; Jacobson, Elaine L.; Jacobson, Myron K.  
CS Texas Coll. Osteopath. Med., Univ. North Texas, Fort Worth, TX, 76107, USA  
SO Biochemistry (1993), 32(6), 1528-34  
CODEN: BICHAW; ISSN: 0006-2960  
DT Journal  
LA English  
CC 33-9 (Carbohydrates)  
Section cross-reference(s): 6, 34  
AB The synthesis and characterization of model conjugates for protein glycation of lysine residues by ADP-ribose, is described. Two stable conjugates derived from ADP-ribose and n-butylamine were isolated and characterized. Both conjugates were shown to be keto amines derived from a Schiff base by an Amadori rearrangement. The chem. stability of the keto amines allowed them to be differentiated from all classes of enzymic protein modification by ADP-ribose. Further, their chem. properties suggest that a previous report of histone H1 modification in carcinogen treated cells was due to glycation by ADP-ribose.  
ST protein glycation ADP ribose; keto amine ADP prepn oximation  
IT Proteins, reactions  
RL: RCT (Reactant)

. (glycation of lysine residues in, with ADP-ribose, model conjugates for)

IT Glycosidation  
 . (glycation, of proteins with ADP-ribose, model conjugates for)

IT 109-73-9, 1-Butanamine, reactions  
 RL: RCT (Reactant)  
 (condensation of, with ADP)

IT 20762-30-5P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (model conjugates for protein glycation by, prepn. of)

IT 146919-58-6P 147071-32-7P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (prepn. and NMR of)

IT 146919-61-1P 147369-21-9P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation)  
 (prepn., oximation, and NMR of)

=> fil medline

FILE 'MEDLINE' ENTERED AT 14:46:36 ON 19 DEC 2001

FILE LAST UPDATED: 18 DEC 2001 (20011218/UP). FILE COVERS 1958 TO DATE.

On April 22, 2001, MEDLINE was reloaded. See HELP RLOAD for details.

MEDLINE now contains IN-PROCESS records. See HELP CONTENT for details.

MEDLINE is now updated 4 times per week. A new current-awareness alert frequency (EVERYUPDATE) is available. See HELP UPDATE for more information.

MEDLINE thesauri in the /CN, /CT, and /MN fields incorporate the MeSH 2001 vocabulary. Enter HELP THESAURUS for details.

The OLDMEDLINE file segment now contains data from 1958 through 1965. Enter HELP CONTENT for details.

Left, right, and simultaneous left and right truncation are available in the Basic Index. See HELP SFIELDS for details.

THIS FILE CONTAINS CAS REGISTRY NUMBERS FOR EASY AND ACCURATE SUBSTANCE IDENTIFICATION.

=> d all tot

L89 ANSWER 1 OF 6 MEDLINE  
 AN 2001031037 MEDLINE  
 DN 20480718 PubMed ID: 11025199  
 TI Formation of a protein-bound pyrazinium free radical cation during glycation of histone H1.  
 AU Wondrak G T; Varadarajan S; Butterfield D A; Jacobson M  
 K  
 CS College of Pharmacy, University of Kentucky, Lexington, KY 40506-0055, USA.  
 NC CA43894 (NCI)  
 NS38496 (NINDS)  
 SO FREE RADICAL BIOLOGY AND MEDICINE, (2000 Sep 15) 29 (6) 557-67.  
 Journal code: FRE. ISSN: 0891-5849.  
 CY United States  
 DT Journal; Article; (JOURNAL ARTICLE)  
 LA English  
 FS Priority Journals  
 EM 200011  
 ED Entered STN: 20010322  
 Last Updated on STN: 20010322

Entered Medline: 20001117

- AB **Glycation**, the nonenzymatic reaction between protein amino groups and reducing sugars, induces protein damage that has been linked to several pathological conditions, especially diabetes, and general aging. Here we describe the direct identification of a protein-bound free radical formed during early **glycation** of **histone H1** in vitro. Earlier EPR analysis of thermal browning reactions between free amino acids and reducing sugars has implicated the sugar fragmentation product glycolaldehyde in the generation of a 1,4-disubstituted pyrazinium free radical cation. In order to evaluate the potential formation of this radical in vivo, the early **glycation** of BSA, lysozyme, and **histone H1** by several sugars (D-glucose, D-ribose, **ADP-ribose**, glycolaldehyde) under conditions of physiological pH and temperature was examined by EPR. The pyrazinium free radical cation was identified on **histone H1** **glycated** by glycolaldehyde ( $g = 2.00539$ ,  $a_N = 8.01$  [2N],  $a_H = 5.26$  [4H],  $a_H = 2.72$  [4H]), or **ADP-ribose**. Reaction of glycolaldehyde with poly-L-lysine produced an identical signal, whereas reaction with BSA or lysozyme produced only a minor unresolved singlet signal. In the absence of oxygen the signal was stable over several days. Our results raise the possibility that pyrazinium radicals may form during **glycation** of **histone H1** in vivo.
- CT Check Tags: Animal; Support, U.S. Gov't, P.H.S.  
 Acetaldehyde: AA, analogs & derivatives  
 Acetaldehyde: ME, metabolism  
**Adenosine Diphosphate Ribose: ME, metabolism**  
 Antioxidants: PD, pharmacology  
 Cations  
 Cattle  
 Cross-Linking Reagents: ME, metabolism  
 Electron Spin Resonance Spectroscopy  
 Free Radicals: CH, chemistry  
 \*Free Radicals: ME, metabolism  
 Glutathione: AA, analogs & derivatives  
 Glutathione: ME, metabolism  
**Glycosylation: DE, drug effects**  
**Histones: CH, chemistry**  
 \***Histones: ME, metabolism**  
 Hydrogen-Ion Concentration  
 Lysine: AA, analogs & derivatives  
 Lysine: ME, metabolism  
 Maillard Reaction  
 Polylysine: ME, metabolism  
 Pyrazines: CH, chemistry  
 \*Pyrazines: ME, metabolism  
 Ribose: ME, metabolism
- RN 141-46-8 (glycolaldehyde); 1946-82-3 (N(alpha)-acetyllysine);  
 20762-30-5 (**Adenosine Diphosphate Ribose**); 25104-18-1  
 (Polylysine); 50-69-1 (Ribose); 56-87-1 (Lysine); 70-18-8 (Glutathione);  
 75-07-0 (Acetaldehyde)
- CN 0 (Antioxidants); 0 (Cations); 0 (Cross-Linking Reagents); 0 (Free  
 Radicals); 0 (**Histones**); 0 (Pyrazines)
- L89 ANSWER 2 OF 6 MEDLINE  
 AN 97336932 MEDLINE  
 DN 97336932 PubMed ID: 9193679  
 TI **ADP-ribose in glycation and glycoxidation reactions.**  
 AU **Jacobson E L; Cervantes-Laurean D; Jacobson M K**  
 CS Department of Clinical Sciences, College of Pharmacy, University of  
 Kentucky, Lexington 40506-0286, USA.  
 NC CA43894 (NCI)  
 SO ADVANCES IN EXPERIMENTAL MEDICINE AND BIOLOGY, (1997) 419 371-9. Ref: 24  
 Journal code: 2LU; 0121103. ISSN: 0065-2598.  
 CY United States  
 DT Journal; Article; (JOURNAL ARTICLE)

General Review; (REVIEW)  
(REVIEW, TUTORIAL)

LA English  
FS Priority Journals  
EM 199709  
ED Entered STN: 19970916  
Last Updated on STN: 19970916  
Entered Medline: 19970904

AB Glycation is initiated by reaction of a reducing sugar with a protein amino group to generate a Schiff base adduct. Following an Amadori rearrangement to form a ketoamine adduct, a complex chemistry involving oxidation often leads to protein glycoxidation products referred to as advanced glycosylation end products (AGE). The AGE include protein carboxymethyllysine (CML) residues and a heterogeneous group of complex modifications characterized by high fluorescence and protein-protein cross links. The sugar sources for the glycoxidation of intracellular proteins are not well defined but pentoses have been implicated because they are efficient precursors for the formation of the fluorescent AGE, pentosidine. ADP-ribose, generated from NAD by ADP-ribose transfer reactions, is a likely intracellular source of a reducing pentose moiety. Incubation of ADP-ribose with histones results in the formation of ketoamine glycation conjugates and also leads to the rapid formation of protein CML residues, histone H1 dimers, and highly fluorescent products with properties similar to the AGE. ADP-ribose is much more efficient than other possible pentose donors for glycation and glycoxidation of protein amino groups. Recently developed methods that differentiate nonenzymic modifications of proteins by ADP-ribose from enzymic modifications now allow investigations to establish whether some protein modifications by monomers of ADP-ribose in vivo represent glycation and glycoxidation.

CT Check Tags: Human; Support, U.S. Gov't, P.H.S.  
\*Adenosine Diphosphate Ribose: ME, metabolism  
Arginine: ME, metabolism  
Fluorescence  
Glycosylation  
Glycosylation End Products, Advanced: ME, metabolism  
Hexosamines: ME, metabolism  
Histones: ME, metabolism  
Ketoses: ME, metabolism  
Lysine: ME, metabolism  
Oxidation-Reduction

RN 20762-30-5 (Adenosine Diphosphate Ribose); 56-87-1 (Lysine);  
7004-12-8 (Arginine)

CN 0 (Glycosylation End Products, Advanced); 0 (Hexosamines); 0 (Histones); 0 (Ketoses)

L89 ANSWER 3 OF 6 MEDLINE  
AN 96291622 MEDLINE  
DN 96291622 PubMed ID: 8726360  
TI Decreased heterogeneity of CS histone variants after hydrolysis of the ADP-ribose moiety.  
AU Imschenetzky M; Morin V; Carvajal N; Montecino M; Puchi M  
CS Department of Molecular Biology, Universidad de Concepcion, Chile.  
SO JOURNAL OF CELLULAR BIOCHEMISTRY, (1996 Apr) 61 (1) 109-17.  
Journal code: HNF; 8205768. ISSN: 0730-2312.  
CY United States  
DT Journal; Article; (JOURNAL ARTICLE)  
LA English  
FS Priority Journals  
EM 199610  
ED Entered STN: 19961025  
Last Updated on STN: 19980206

Entered Medline: 19961015

- AB Sea urchin CS histone variants are electrophoretically heterogeneous when analyzed in two dimensional polyacrylamide gels (2D-PAGE). Previous results suggested that this heterogeneity is due to the poly (ADP-ribosylation) of these proteins. Consequently, native CS histone variants were subjected to different treatments to remove the ADP-ribose moiety. The incubation in 1 M hydroxylamine was not effective in eliminating the polymers of ADP-ribose from CS variants, and the treatment with sodium hydroxide was deleterious to the proteins. In contrast, the ADP-ribose moiety was successfully removed from the CS variants by incubation with phosphodiesterase (PDE). To eliminate contamination of CS histone variants with PDE extract, the enzyme was covalently bound to Sepharose 4B prior to its utilization. Treatment of native CS histone variants with this immobilized phosphodiesterase removed around 85% of the total ADP-ribose moiety from these proteins. After S-PDE treatment the complex electrophoretic pattern of CS histone variants in 2-D PAGE decreases to five major fractions. From these results we conclude that the electrophoretic heterogeneity of native CS histone variants is mainly due to the extent to which five main CS histone variants are poly(ADP)-ribosylated).
- CT Check Tags: Animal; Female; Male; Support, Non-U.S. Gov't  
 \*Adenosine Diphosphate Ribose: ME, metabolism  
 Blotting, Western  
 Cleavage Stage, Ovum  
 Dansyl Compounds: PD, pharmacology  
 Electrophoresis, Polyacrylamide Gel  
 Fluorescent Dyes  
 Glycosylation: DE, drug effects  
 \*Histones: ME, metabolism  
 Hydrazines: PD, pharmacology  
 Hydrolysis  
 Hydroxylamine  
 Hydroxylamines: PD, pharmacology  
 Periodic Acid: PD, pharmacology  
 Phosphoric Diester Hydrolases: PD, pharmacology  
 Poly Adenosine Diphosphate Ribose: AN, analysis  
 Sea Urchins  
 Sodium Hydroxide: PD, pharmacology  
 Variation (Genetics)
- RN 10450-60-9 (Periodic Acid); 1310-73-2 (Sodium Hydroxide); 20762-30-5 (Adenosine Diphosphate Ribose); 26656-46-2 (Poly Adenosine Diphosphate Ribose); 33008-06-9 (dansyl hydrazine); 7803-49-8 (Hydroxylamine)
- CN 0 (Dansyl Compounds); 0 (Fluorescent Dyes); 0 (Histones); 0 (Hydrazines); 0 (Hydroxylamines); EC 3.1.4 (Phosphoric Diester Hydrolases); EC 3.1.4.1 (phosphodiesterase I)
- L89 ANSWER 4 OF 6 MEDLINE  
 AN 96209963 MEDLINE  
 DN 96209963 PubMed ID: 8631841  
 TI Glycation and glycooxidation of histones by ADP-ribose.  
 AU Cervantes-Laurean D; Jacobson E L; Jacobson M K  
 CS Division of Medicinal Chemistry and Pharmaceutics, College of Pharmacy, University of Kentucky, Lexington 40536, USA.  
 NC CA43894 (NCI)  
 SO JOURNAL OF BIOLOGICAL CHEMISTRY, (1996 May 3) 271 (18) 10461-9.  
 Journal code: HIV; 2985121R. ISSN: 0021-9258.  
 CY United States  
 DT Journal; Article; (JOURNAL ARTICLE)  
 LA English  
 FS Priority Journals  
 EM 199607  
 ED Entered STN: 19960715  
 Last Updated on STN: 19960715

Entered Medline: 19960701

AB The reaction of long lived **proteins** with reducing sugars has been implicated in the pathophysiology of aging and age-related diseases. A likely intranuclear source of reducing sugar is **ADP-ribose**, which is generated following DNA damage from the turnover of **ADP-ribose** polymers. In this study, **ADP-ribose** has been shown to be a potent **histone** glycation and glycoxidation agent in vitro. Incubation of **ADP-ribose** with **histones H1, H2A, H2B, and H4** at pH 7.5 resulted in the formation of **ketoamine glycation** conjugates. Incubation of **histone H1** with **ADP-ribose** also rapidly resulted in the formation of **protein carboxymethyllysine** residues, **protein-protein** cross-links, and highly fluorescent products with properties similar to the **advanced glycosylation end product** pentosidine. The formation of **glycoxidation** products was related to the degradation of **ketoamine glycation** conjugates by two different pathways. One pathway resulted in the formation of **protein carboxymethyllysine** residues and release of an **ADP** moiety containing a glyceric acid fragment. A second pathway resulted in the release of **ADP**, and it is postulated that this pathway is involved in the formation of **histone-histone** cross-links and fluorescent **advanced glycosylation end products**.

CT Check Tags: Human; Support, U.S. Gov't, P.H.S.

\***Adenosine Diphosphate Ribose**: CH, chemistry  
Fluorescence

\***Glucose**: CH, chemistry

\***Histones**: ME, metabolism

Magnetic Resonance Spectroscopy

RN 20762-30-5 (**Adenosine Diphosphate Ribose**); 50-99-7 (**Glucose**)

CN 0 (**Histones**)

L89 ANSWER 5 OF 6 MEDLINE

AN 93160190 MEDLINE

DN 93160190 PubMed ID: 8431431

TI Protein glycation by **ADP-ribose**: studies of model conjugates.

AU Cervantes-Laurean D; Minter D E; Jacobson E L; Jacobson M  
K

CS Department of Biochemistry and Molecular Biology, Texas College of Osteopathic Medicine, University of North Texas, Fort Worth 76107.

NC CA43894 (NCI)

SO BIOCHEMISTRY, (1993 Feb 16) 32 (6) 1528-34.

Journal code: AOG; 0370623. ISSN: 0006-2960.

CY United States

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

EM 199303

ED Entered STN: 19930402

Last Updated on STN: 19970203

Entered Medline: 19930315

AB Protein **glycation** by hexoses has been implicated in the pathophysiology of a number of diseases as well as the aging process. Studies of **ADP-ribose** polymer metabolism have shown that free **ADP-ribose** is generated at high rates in the cell nucleus following DNA damage. Protein **glycation** by **ADP-ribose** has been reported although the chemistry is not understood. Described here is the synthesis and characterization of model conjugates for protein **glycation** of lysine residues by **ADP-ribose**. Two stable conjugates derived from **ADP-ribose** and **n-butylamine** were isolated and characterized. Both conjugates were shown to be **ketoamines** derived from a Schiff base by an **Amadori** rearrangement. The chemical stability of the **ketoamines** allowed them to be differentiated from all classes of enzymic

protein modification by ADP-ribose. Further, their chemical properties suggest that a previous report of histone H1 modification in carcinogen treated cells was due to glycation by ADP-ribose.

CT Check Tags: Support, U.S. Gov't, Non-P.H.S.; Support, U.S. Gov't, P.H.S.

\*Adenosine Diphosphate Ribose: CH, chemistry

\*Adenosine Diphosphate Ribose: ME, metabolism

\*Amines

Colorimetry

\*Glycoproteins: ME, metabolism

Glycosylation

Indicators and Reagents

Kinetics

\*Lysine

Magnetic Resonance Spectroscopy

Models, Chemical

Proteins: ME, metabolism

Time Factors

RN 20762-30-5 (Adenosine Diphosphate Ribose); 56-87-1 (Lysine)

CN 0 (Amines); 0 (Glycoproteins); 0 (Indicators and Reagents); 0 (Proteins)

L89 ANSWER 6 OF 6 MEDLINE

AN 83127216 MEDLINE

DN 83127216 PubMed ID: 6824639

TI Glycosylation, ADP-ribosylation, and methylation of Tetrahymena histones.

AU Levy-Wilson B

SO BIOCHEMISTRY, (1983 Jan 18) 22 (2) 484-9.

Journal code: AOG; 0370623. ISSN: 0006-2960.

CY United States

DT Journal; Article; (JOURNAL ARTICLE)

LA English

FS Priority Journals

EM 198304

ED Entered STN: 19900318

Last Updated on STN: 19900318

Entered Medline: 19830421

AB We have examined some of the postsynthetic modifications that occur in macronuclear histones from Tetrahymena thermophila. When purified macronuclei are incubated with [32P]NAD+, histones H1, H2A, H2B, and H3 are ADP-ribosylated. Furthermore, histones H1, H2A, H2B, and H3 contain fucose and mannose residues as evidenced by the incorporation of [3H]fucose and by the specific binding to these proteins of gorse seed lectin and concanavalin A. Finally, our studies on incorporation of methyl groups into histones show that histone H2A, together with the related nonhistone protein A24, is methylated in Tetrahymena.

CT Check Tags: Animal; Support, U.S. Gov't, P.H.S.

\*Adenosine Diphosphate Ribose: ME, metabolism

Cell Nucleus: AN, analysis

Concanavalin A: ME, metabolism

\*Fucose: ME, metabolism

\*Histones: ME, metabolism

Lectins

Mannose: ME, metabolism

Methylation

\*Nucleoside Diphosphate Sugars: ME, metabolism

\*Tetrahymena: AN, analysis

RN 11028-71-0 (Concanavalin A); 20762-30-5 (Adenosine Diphosphate Ribose); 31103-86-3 (Mannose); 3713-31-3 (Fucose)

CN 0 (Histones); 0 (Lectins); 0 (Nucleoside Diphosphate Sugars); 0 (gorse agglutinin)

=> fil biotechds

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L92 ANSWER 1 OF 1 BIOTECHDS COPYRIGHT 2001 DERWENT INFORMATION LTD  
AN 1993-05806 BIOTECHDS  
TI A new approach for the synthesis of affinity resins: enzymatic synthesis  
of **poly(ADP-ribose)**-agarose beads;  
**poly-ADP-ribose**-agarose bead adsorbent  
production using NAD-ADP-ribosyltransferase (conference abstract)  
AU Panzeter P L; Zweifel B; Althaus F R  
LO Institute of Pharmacology and Biochemistry, University of Zuerich,  
CH-8057 Zuerich, Switzerland.  
SO J.Cell.Biochem.; (1993) Suppl.17A, 50  
CODEN: JCEBD5  
DT Journal  
LA English  
AB A **poly-ADP-ribose**-agarose affinity resin  
was produced by an enzymatic approach, using **poly-ADP**  
**-ribose**-polymerase (NAD-ADP-ribosyltransferase, EC-2.4.2.30)  
and NAD<sup>+</sup> or (**ADP-ribose**)-agarose beads. Both resins  
were recognized as acceptors by the enzyme, which elongated the existing  
ligands to form polymers closely resembling those modifying proteins.  
Addition of **ADP-ribose** residues depended on enzyme  
activity, time of incubation, the concentration of free NAD<sup>+</sup> available as  
a substrate, the amount of derivatized agarose, and the chemical moiety  
through which the ligand was linked to the agarose. Fractionation of rat  
liver nuclear lysate over the **poly-ADP-ribose**  
resin revealed a strong affinity of **histone H1** for  
**ADP-ribose** polymers. This resin could also be used to  
purify the catabolic analog of **poly-ADP-**  
**ribose**-polymerase, **poly-ADP-ribose**  
-glycohydrolase, and to study polymer-binding proteins from other  
species. Such an enzymatic approach to synthesizing affinity resins,  
when possible, could improve binding efficiencies and capacities by  
optimizing ligand orientation. (0 ref)  
CC H OTHER CHEMICALS; H1 Polymers; L PURIFICATION; L1 Downstream Processing;  
K BIOCATALYSIS; K2 Application  
CT **POLY-ADP-RIBOSE-AGAROSE BEAD PREP.**,  
NAD-ADP-RIBOSYLTRANSFERASE, APPL. ADSORBENT, AFFINITY CHROMATOGRAPHY  
PROTEIN PURIFICATION POLYMER HET-N RING-5 RING-6 COND.RING AMINE  
NUCLEOTIDE SUGAR ENZYME EC-2.4.2.30

=> fil wpix  
FILE 'WPIX' ENTERED AT 14:56:38 ON 19 DEC 2001  
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FILE LAST UPDATED: 17 DEC 2001 <20011217/UP>  
MOST RECENT DERWENT UPDATE 200174 <200174/DW>  
DERWENT WORLD PATENTS INDEX SUBSCRIBER FILE, COVERS 1963 TO DATE

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SEE <http://www.derwent.com/dwpi/updates/dwpicov/index.html> <<<

=> d all abeq tech

L105 ANSWER 1 OF 1 WPIX COPYRIGHT 2001 DERWENT INFORMATION LTD  
AN 2000-339763 [29] WPIX  
DNN N2000-255026 DNC C2000-103203  
TI Detecting **poly(ADP-ribose)** polymerase)  
activity useful for identifying inhibitors or activators of the enzyme  
uses specific antibodies to detect **poly(ADP-ribose)** product.  
DC B04 D16 S03  
IN DE MURCIA, G; DECKER, P; MULLER, S  
PA (CNRS) CNRS CENT NAT RECH SCI; (CNRS) CENT NAT RECH SCI  
CYC 21  
PI WO 2000023804 A1 20000427 (200029)\* FR 37p G01N033-573 <--  
RW: AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
W: CA JP US  
FR 2785053 A1 20000428 (200029) G01N033-573 <--  
ADT WO 2000023804 A1 WO 1999-FR2456 19991012; FR 2785053 A1 FR 1998-13211  
19981021  
PRAI FR 1998-13211 19981021  
IC ICM G01N033-573  
ICS C12Q001-48; G01N033-544  
AB WO 200023804 A UPAB: 20000617  
NOVELTY - Detection of **poly(ADP-ribose)**  
polymerase) (PARP) (I) activity, is new and comprises detecting binding  
between (I) and **poly(ADP-ribose)** (II), using  
an antibody (Ab) specific for (II).  
DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for a  
kit for detecting (I) comprising PARP, at least one Ab, media and buffers  
required for:  
(i) adsorption of (II) on an ELISA (enzyme-linked immunosorbant  
assay) support;  
(ii) detection of Ab; and  
(iii) formation of Ab-(II) complex;  
and optionally a second antibody (Ab2), optionally labeled with  
enzyme, that forms a complex with Ab, a substrate for the enzyme,  
chromogen and stop reagent, media and buffers for the Ab-Ab2 reaction, and  
an inhibitor or activator of (I) as internal standard.  
USE - The method is useful for detecting (I), and particularly for  
identifying agents that inhibit or activate the activity of (I) (claimed).  
ADVANTAGE - The method is simple, rapid, specific and extremely  
sensitive (allowing detection of modulators at the nanomolar level) and it  
does not require use of radioactive labels.  
Dwg.0/5  
FS CPI EPI  
FA AB; DCN  
MC CPI: B04-B03B; B04-D01; B04-G21; B04-G22; B04-L04A; B11-C07A4; B11-C07B1;  
B12-K04; B12-K04E; D05-H09; D05-H10; D05-H11A; D05-H11B; D05-H12;  
D05-H18  
EPI: S03-E14H4  
TECH UPTX: 20000617  
TECHNOLOGY FOCUS - BIOLOGY - Preferred Method: To detect an  
inhibitor/activator of (I), the new method is used to measure activity of  
(I) in the presence and absence of a test compound (present at less than  
250, especially 25-200, nM) and the results compared. Preferably, (I) is  
adsorbed on to a support (particularly a plastic microtiter plate), then  
treated with a reaction medium containing the components necessary for (I)  
activity, resulting in formation of (II) and binding of (II) to at least  
one nuclear acceptor protein (present in the medium or adsorbed). A medium  
containing Ab is then added to form a complex with (II) bound to (I) and  
this complex is detected and (I) activity measured. The first medium added

may also include a test compound. Adsorption of (I) is from a medium that contains a compound (A) that can act as screen between damaged DNA and (A) and a compound (B) that promotes formation of zinc fingers. The first medium contains a substrate for (I) (specifically oxidized beta-nicotinamide-adenine dinucleotide, NAD), a (I) co-factor (specifically damaged DNA), a reducing agent (specifically dithiothreitol, DTT), (A) and (B). Ab is added after dilution with medium that prevents non-specific reactions, particularly one containing bovine serum albumin (BSA). Complex formation is determined using a second antibody (Ab2) coupled to an enzyme and the binding of Ab and Ab2 is detected by colorimetry, after adding an enzyme substrate, especially tetramethylbenzidine and hydrogen peroxide. Preferred reaction mixtures contain 0.2 - 0.6 mug/ml (I); 1-15 mug/ml damaged DNA; 10-30 muM zinc chloride; 3-5 mM magnesium chloride; 25-75 mM oxidized NAD; 0.8-1.2 mM DTT; Ab at a dilution of 1/500-1/2000; and BSA at 0.2-0.6 wt.-vol.%. Preferred Materials: The nuclear acceptor is particularly (I) but may also be a histone, high mobility group protein, topoisomerase, DNA polymerase or DNA ligase. (A) is spermine, spermidine or preferably magnesium chloride, and (B) is zinc chloride. Ab may be commercial mono- or polyclonal antibodies.

=> d his

(FILE 'HOME' ENTERED AT 14:10:17 ON 19 DEC 2001)  
SET COST OFF

FILE 'REGISTRY' ENTERED AT 14:10:30 ON 19 DEC 2001

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E HISTONE/CN
E HISTONE H1/CN
L1      137 S HISTONE H1
L2      123 S L1 AND HISTONE/INS.HP
L3      14 S L1 NOT L2
L4      5 S L3 NOT (GENE OR DNA)
L5      4 S L4 NOT SQL/FA
L6      0 S L2 NOT SQL/FA
E ADP-RIBOSE/CN
E ADP RIBOSE/CN
L7      1 S E3
SEL RN
L8      3 S E1/CRN
E AMINOGUANIDINE/CN
L9      1 S E3
SEL RN
L10     133 S E1/CRN
L11     40 S L10 NOT COMPD
L12     32 S L11 NOT (IDS OR MXS)/CI
L13     4 S L12 AND (CLH OR HI)
L14     129 S L10 NOT L13

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FILE 'HCAPLUS' ENTERED AT 14:18:00 ON 19 DEC 2001

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L15     714 S L5
L16     4333 S HISTONE H1

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FILE 'REGISTRY' ENTERED AT 14:18:33 ON 19 DEC 2001

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L17     133 S L1 NOT L5

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FILE 'HCAPLUS' ENTERED AT 14:18:38 ON 19 DEC 2001

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L18     428 S L17
L19     5016 S L15,L16,L18
E HISTONE/CT
L20     252 S E7
E E7+ALL
L21     2401 S E2
L22     5016 S L19,L20
L23     1210 S L7,L8

```

L24 5267 S ADP RIBOSE  
 L25 3764 S POLY ADP RIBOSE  
 L26 924 S ADPRIBOSE OR POLYADPRIBOSE OR POLYADP RIBOSE OR POLY ADPRIBOS  
 L27 5542 S L23-L26  
 L28 169 S L22 AND L27  
 L29 705 S PROTEIN(L)ADVANC?(L) (ENDPRODUCT OR END PRODUCT) (L) GLYCAT?  
 L30 1237 S ?PROTEIN?(L)ADVANC?(L) (ENDPRODUCT OR END PRODUCT) (L) (GLYCAT?  
 L31 4 S L29,L30 AND L28  
 E ADVANCED GLYCATION END PRODUCT/CT  
 E E4+ALL  
 L32 907 S E1,E2  
 E ADVANCED GLYCATION END PRODUCT/CT  
 E E9+ALL  
 L33 648 S E1,E2  
 L34 3 S L32,L33 AND L28  
 L35 4 S L31,L34  
 L36 4 S HISTONE AND L27 AND L29,L30,L32,L33  
 L37 4 S L35,L36  
 E JACOBSON E/AU  
 L38 101 S E3,E11,E21-E23  
 E JACOBSON M/AU  
 L39 80 S E3,E11  
 E JACOBSON MYRON/AU  
 L40 113 S E3-E5  
 E WONDRAK G/AU  
 L41 15 S E3-E7  
 L42 4 S L38-L41 AND L37  
 L43 4 S L38-L41 AND L29,L30,L32,L33  
 L44 22 S L38-L41 AND (GLYCAT? OR GLYCOSYLAT? OR GLYCOSIDAT?)  
 L45 7 S L38-L41 AND L22  
 L46 89 S L38-L41 AND L27  
 L47 18 S L46 AND L44,L45  
 L48 87 S L28-L41 AND GLYCOXIDAT?  
 L49 2 S L48 AND L44,L45  
 L50 18 S L47,L49  
 L51 4 S L43 AND L50  
 L52 18 S L44,L45,L47,L49,L50 NOT L51  
 L53 3 S L52 AND (PROTEIN AND GLYCATION)/TI  
 L54 2 S L52 AND HISTONE/TI  
 L55 8 S L51,L53,L54  
 SEL HIT RN

FILE 'REGISTRY' ENTERED AT 14:31:46 ON 19 DEC 2001

L56 1 S E1

FILE 'HCAPLUS' ENTERED AT 14:31:52 ON 19 DEC 2001

L57 2 S L55 AND (L9 OR AMINOGUANIDINE OR AMINO GUANIDINE)

L58 0 S L1 AND L55

L59 8 S L55,L57

FILE 'REGISTRY' ENTERED AT 14:32:55 ON 19 DEC 2001

L60 5 S L56,L8,L9

FILE 'REGISTRY' ENTERED AT 14:33:43 ON 19 DEC 2001

FILE 'HCAPLUS' ENTERED AT 14:33:52 ON 19 DEC 2001

E NIADYNE/PA,CS

L61 6 S E3-E10

L62 4 S L61 NOT L59

FILE 'BIOSIS' ENTERED AT 14:36:05 ON 19 DEC 2001

L63 3261 S L1 OR HISTONE H1

L64 22039 S HISTONE

L65 3938 S HISTONE(L)H1

L66 946 S HISTONE(L)H 1

L67 22250 S L63-L66

L68 5242 S L27  
L69 357 S L67 AND L68  
L70 853 S L29 OR L30  
L71 34202 S GLYCAT? OR GLYCOXIDAT? OR GLYCOSYLAT? OR GLYCOSIDAT?  
L72 1 S L69 AND L70  
L73 4 S L69 AND L71  
L74 4 S L72,L73

FILE 'HCAPLUS, BIOSIS' ENTERED AT 14:38:55 ON 19 DEC 2001  
L75 8 DUP REM L59 L74 (4 DUPLICATES REMOVED)

FILE 'MEDLINE' ENTERED AT 14:39:01 ON 19 DEC 2001  
L76 21423 S L67  
E HISTONE/CT  
E E19+ALL  
E E2+ALL  
L77 12880 S E9+NT  
L78 21423 S E12-E21/BI  
L79 21423 S L76-L78  
L80 5772 S L27  
L81 3279 S ADENOSINE DIPHOSPHATE RIBOSE  
L82 405 S L79 AND L80,L81  
L83 35800 S L70,L71  
L84 6 S L82 AND L83  
E GLYCOSYLATION END PRODUCTS/CT  
E E4+ALL  
L85 1047 S E3+NT  
L86 1 S L82 AND L85  
L87 6 S L84,L86  
L88 4 S L87 AND (JACOBSON ? OR WONDRAK ?)/AU  
L89 6 S L87,L88

FILE 'MEDLINE' ENTERED AT 14:46:36 ON 19 DEC 2001

FILE 'BIOTECHDS' ENTERED AT 14:47:18 ON 19 DEC 2001  
L90 238 S L64-L66  
L91 42 S L24-L26,L81  
L92 1 S L90 AND L91

FILE 'BIOTECHDS' ENTERED AT 14:48:30 ON 19 DEC 2001

FILE 'BIOTECHNO' ENTERED AT 14:48:50 ON 19 DEC 2001  
L93 7422 S L90  
L94 1874 S L91  
L95 119 S L93 AND L94  
L96 15358 S L83  
L97 119 S (L93 OR HISTONE) AND L94  
L98 2 S L97 AND L96

FILE 'WPIX' ENTERED AT 14:53:45 ON 19 DEC 2001

E HISTON  
L99 326 S E3-E8  
L100 118 S L24-L26,L81  
L101 13 S POLY()L81  
L102 3 S L100,L101 AND L99  
L103 0 S L102 AND L71  
L104 0 S L102 AND L29,L30  
L105 1 S L102 AND G01N/ICM

FILE 'WPIX' ENTERED AT 14:56:38 ON 19 DEC 2001

E US2000-197829/AP, PRN  
E JACOBSON E/AU  
L106 23 S E3,E9  
E JACOBSON M/AU  
L107 35 S E3,E11  
E WONDRAK G/AU

L108

E WO2001079842/PN  
O S L106,L107 AND L99-L101